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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/767,394 | FERMAN ET AL. | |
| | Examiner | Art Unit | |
| | Amara Abdi | 2624 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-4,6,7,10-17,19-22,25-27 and 29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *28* is/are allowed.

6)☒ Claim(s) *1-4,6,7,10-17,19-22,25-27 and 29* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. Applicant's response to the last office action, filed May 29, 2007 has been entered and made of record.

2. In view of the Applicant amendments, the objection to the specification (page 5, line 2) is expressly withdrawn.

3. In view of the Applicant amendments, the objection to the Abstract is expressly withdrawn.

4. In view of the Applicant amendments, the objection to the claims 2-6,8-9,11-12, and 14-24 is expressly withdrawn.

5. In view of the Applicant amendments, the rejection under 35 U.S.C. §112, second paragraph to the claims 10-14 is expressly withdrawn.

6. Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 101*

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. The claimed invention is directed to non-statutory subject matter. Claim 26 is rejected.

In claim 26, "a computer-readable medium comprising computer-executable instruction" must be "a computer-readable medium encoded with computer-executable instruction" to be statutory subject matter.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 1,3,6-7, and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

**(1) In claim 1**, "the calculating of **an area luminance histogram**" was mentioned. There is no support for the calculating of **the area** in the specification. The calculating of the luminance histogram was mentioned in the specification. However, the calculating of the luminance histogram is different from the calculating of the area as claimed in claim 1.

**(2) In claim 3**, "the expanding of the background region beyond the initial maximum histogram bin into neighboring histogram bin when neighboring histogram bin contain a sufficient number of pixels" was claimed but it doesn't have any support from the specification.

**(3) In claim 6**, "the eliminating of the two histogram bins **containing the highest number of pixels**", the removing of the two histogram bin was mentioned in the specification, but "containing the highest number of pixels" was not mentioned in the

specification with the removing of the two histogram bin, therefore, it doesn't have any support from the specification.

**(4) In claim 7**, "the chrominance histogram" was claimed but it does not have any support from the specification. The "chrominance" was mentioned in the specification". However, "the chrominance" is different from the "chrominance histogram", therefore, it's considered as a new matter.

**(5) In claim 13**, "the chrominance histogram' was introduced in the claim, but it doesn't have any support from the specification. The chrominance data was mentioned in the specification. However, the chrominance histogram is different from the chrominance data, therefore, it is considered as a new matter.

### *Claim Rejections - 35 USC § 103*

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-2,4, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al. (US 6,973,213) in view of Szeliski (US 6,687,400) and Horie (US 6,628,833).

**(1) Regarding claims 1 and 26:**

Fan et al. disclose an image segmentation method and program (column 4, line 6-8), (the program is read as an algorithm), comprising:

a) obtaining pixel attribute data for a mixed-content image (column 3, line 22);

b) identifying a text region in said image (column 3, line 24-25);

c) identifying a background region in said image (column 3, line 24);

d) analyzing areas in said image outside any of said background regions and outside any of said text regions to identify contone regions (column 3, line 28-29);

e) analyzing said contone regions to identify any text regions present within said contone regions (column 3, line 32-33);

f) analyzing said contone regions to identify any background regions present in said contone regions (column 3, line 31);

g) analyzing areas in said contone regions outside any of said background regions and outside any of said text regions to identify contone sub-regions (column 3, line 36-38); and

h) repeating steps e-g until no further sub-regions are found (column 3, line 38-40). (Column 3, line 18-40), (the examiner interpreted that the concept of the invention is the same)

Fan et al. does not explicitly mention:

1) a) the calculating of luminance histogram, b) identifying a histogram bin containing a maximum number of pixels, c) comparing the maximum number of values

to the threshold value, and d) classifying a pixel as background, when the maximum number of values is greater than the threshold value.

2) a) calculating the luminance histogram of an area that is not classified as background or text, b) determining the number histogram bin whose pixel count exceed s the threshold value, c) comparing the number of populated histogram bin to the number of the threshold value, d) classifying the area as a contone region, when the number of populated histogram bin exceeds the threshold value.

**I. Concerning a) and b) of both items 1) and 2):**

Szeliski, in analogous environment, teaches a system and process for improving the uniformity of the tone of the digital image, where determining the brightness pixel values (column 9, line 30-35) (the brightness is read as luminance), and a histogram equalization containing a maximum number of pixels (column 7, line 41-49), (the calculating the luminance histogram and the determining the number histogram bin is read as the same concept as the determining the brightness pixel values, and a histogram equalization).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Szeliski, where determining the luminance histogram, in the method of Fan et al. in order to manipulating a set of images of a static scene captured at different exposure to yield a composite image with improved uniformity in exposure and tone (column 1, line 41-44).

**II. Concerning c) and d) of both items 1) and 2):**

Horie teaches an image processing method, where comparing the maximum number of values to the threshold value (column 1, line 56-57, and column 5, line 22-23), and classifying a pixel as background (figure 25, column 9, line 62-67), when the maximum number of values is greater than the threshold value (the examiner interpreted the maximum number of values being greater than the threshold value as inherent), (the comparing the number of populated histogram bin to the number of the threshold value and classifying the area as a contone region, when the number of populated histogram bin exceeds the threshold value is read as the same concept as c) and d) of item 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Horie, where comparing the pixels to the threshold value, in the method of Fan et al. in order to improve the picture quality of the input image using a digital camera or an image scanner (column 1, line 19-20).

**(2) Regarding claim 2:**

Fan et al. further disclose the method, further comprising analyzing the contone regions and the contone sub-regions to identify pictorial contone regions (column 3, line 36-37).

**(3) Regarding claim 4:**

Fan et al. further disclose the method further comprising morphological processing of any of the text regions and any of the background regions to eliminate small isolated regions (column 4, line 29-41).

**(4) Regarding claim 25:**

Fan et al. disclose the image segmentation method, comprising:

a) a reader for obtaining pixel attribute data for a mixed-content image (column 3, line 22);

b) a text identifier for identifying a text region in said image (column 3, line 24-25);

c) a background identifier for identifying a background region in said image (column 3, line 24);

d) a contone analyzer for analyzing areas in said image outside any of said background regions and outside any of said text regions to identify contone regions (column 3, line 28-29);

e) wherein said text analyzer may analyze said contone regions to identify any text regions present within said contone regions;

f) wherein said background analyzer may analyze said contone regions to identify any background regions present in said contone regions (column 3, line 31);

g) wherein said contone analyzer may analyze areas in said contone regions outside any of said background regions and outside any of said text regions to identify contone sub-regions (column 3, line 36-38); and

h) wherein said text analyzer, said background analyzer and said contone analyzer may operate recursively on regions and sub-regions to identify nested regional attributes (column 1, line 14-15, column 5, line 29-31, and line 36-38), (the text analyzer, background analyzer, and the contone analyzer are read as the same concept

as to operate relatively to the region and sub-region properties to fit completely together or with on to another).

Fan et al. does not explicitly mention the apparatus, where:

1) a) the calculating of luminance histogram, b) identifying a histogram bin containing a maximum number of pixels, c) comparing the maximum number of values to the threshold value, and d) classifying a pixel as background, when the maximum number of values is greater than the threshold value.

2) a) calculating the luminance histogram of an area that is not classified as background or text, b) determining the number histogram bin whose pixel count exceed s the threshold value, c) comparing the number of populated histogram bin to the number of the threshold value, d) classifying the area as a contone region, when the number of populated histogram bin exceeds the threshold value.

**I. Concerning a) and b) of both items 1) and 2):**

Szeliski, in analogous environment, teaches a system (column 1, line 40), (the system is read as the same concept as an apparatus) and process for improving the uniformity of the tone of the digital image, where determining the brightness pixel values (column 9, line 30-35) (the brightness is read as luminance), and a histogram equalization containing a maximum number of pixels (column 7, line 41-49), (the calculating the luminance histogram and the determining the number histogram bin is read as the same concept as the determining the brightness pixel values, and a histogram equalization).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Szeliski, where determining the luminance histogram, in the method of Fan et al. in order to manipulating a set of images of a static scene captured at different exposure to yield a composite image with improved uniformity in exposure and tone (column 1, line 41-44).

**II. Concerning c) and d) of both items 1) and 2):**

Horie teaches an image processing method, where comparing the maximum number of values to the threshold value (column 1, line 56-57, and column 5, line 22-23), and classifying a pixel as background (figure 25, column 9, line 62-67), when the maximum number of values is greater than the threshold value (the examiner interpreted the maximum number of values being greater than the threshold value as inherent), (the comparing the number of populated histogram bin to the number of the threshold value and classifying the area as a contone region, when the number of populated histogram bin exceeds the threshold value is read as the same concept as c) and d) of item 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Horie, where comparing the pixels to the threshold value, in the method of Fan et al. in order to improve the picture quality of the input image using a digital camera or an image scanner (column 1, line 19-20).

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al. and Szeliski and Horie, as applied to claim 1 above, and further in view of Barthel et al. (US 6,731,800).

Fan et al. and Szeliski and Horie disclose all the subject matter as described in claim 1 above.

Fan et al. and Szeliski and Horie do not expressly disclose the method, where expanding the background region into neighboring histogram bin.

Barthel et al., in analogous environment, teaches a method for compression scanned colored and gray-scaled documents, where expanding the foreground pixels with an average value filtration for adjoining pixels (column 5, line 7-9), (the expanding of the foreground pixels with an average value filtration for adjoining pixels is read as the same concept as the expanding of the background region into neighboring histogram bin).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Barthel et al., where expanding the background region into neighboring histogram bin, in the method of Fan et al. in order to make possible the compression of scanned documents without being restricted by the nature of the original copies, such as a bright background, rectangular illustrations and precise separation of image and text components (column 2, line 19-23).

14. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al. and Szeliski and Horie, as applied to claim 1 above, and further in view of Loce et al. (US 6,449,396).

**(1) Regarding claim 7:**

Fan et al. and Szeliski and Horie disclose all the subject matter as described in claim 1 above. (The analyzing of a chrominance histogram of the image comprising the steps I), ii), iii), and iv) is read as the same concept as the analyzing of luminance histogram comprising the steps I), ii), iii), and iv), furthermore, the removing of pixels from the background is read as the classification).

Furthermore, Fan et al. disclose that each pixel value is set of color space coordinate in a "color coordinate form" (column 4, line 4-5), (the color coordinate form is read as hue), and the identification of the background region in an image (column 3, line 24-26), (the identification of the background region in an image is read as the same concept as the identification of the background region in luminance histogram).

Fan et al. and Szeliski and Horie do not disclose the downsampling of the pixel data.

Loce et al., in analogous environment teaches a method of downsampling of the pixel data (column 5, line 43-47), (the halftone process operated in the pictorials data is read as the same concept as the downsampling of the pixels data, since it reduces the number if the bits pixels).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Loce et al., where downsampling of the pixel

data, in the method of Fan et al. in order to improve the efficiency of filtering process in next step by making the rate of number of pixels to be filtered down and that will reduce the noise and objectionable image artifacts (column 5, line 39-40).

**(2) Regarding claim 10:**

Fan et al. and Szeliski and Horie disclose all the subject matter as described in claim 7 above.

Furthermore, Fan et al. disclose that each pixel value is set of color space coordinate in a "color coordinate form" (column 4, line 4-5), (the color coordinate form is read as hue), and the identification of the background region in an image (column 3, line 24-26), (the identification of the background region in an image is read as the same concept as the identification of the background region in luminance histogram).

Fan et al. and Szeliski and Horie do not disclose the downsampling of the pixel data.

Loce et al., in analogous environment teaches a method of downsampling of the pixel data (column 5, line 43-47), (the halftone process operated in the pictorials data is read as the same concept as the downsampling of the pixels data, since it reduces the number if the bits pixels).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Loce et al., where downsampling of the pixel data, in the method of Fan et al. in order to improve the efficiency of filtering process in next step by making the rate of number of pixels to be filtered down and that will reduce the noise and objectionable image artifacts (column 5, line 39-40).

15. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al. and Szeliski and Horie, and Loce et al, and Loce et al., as applied to claim 10, and further in view Kadtke (US 6,564,176).

**(1) Regarding claim 11:**

Fan et al. and Szeliski and Horie, and Loce et al, and Loce et al. disclose all the subject matter as described in claim 10 above.

Fan et al. and Szeliski and Horie, and Loce et al, and Loce et al. do not disclose the method, where the local feature is standard deviation.

Kadtke, in analogous environment, teaches a signal detection and classification technique, where the local feature is standard deviation (column 10, line 38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Kadtke, where the local feature is standard deviation, in the method of Fan et al. in order to provide a good method of signal processing and time series analysis where deterministic signals are desired to be detected and classified (column 2, line 1-3), and this method could be uses in variety of applications such as: Sonar, Radar, Seismic, acoustic, electromagnetic, and optic (column 1, line 65-67).

**(2) Regarding claim 12:**

Fan et al. and Szeliski and Horie, and Loce et al, and Loce et al. disclose all the subject matter as described in claim 10 above.

Fan et al. and Szeliski and Horie, and Loce et al, and Loce et al. do not disclose the method, where the local feature is spread.

Kadtke, in analogous environment, teaches a signal detection and classification technique, where the local feature is spread (column 7, line 46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Kadtke, where the local feature is spread, in the method of Fan et al. in order to provide a good method of signal processing and time series analysis where deterministic signals are desired to be detected and classified (column 2, line 1-3), and this method could be uses in variety of applications such as: Sonar, Radar, Seismic, acoustic, electromagnetic, and optic (column 1, line 65-67).

16. Claim 13-17,19-22, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al. and Szeliski and Horie, and Loce et al. and Kadtke, as applied to claim 10 above, and further in view Horie (US 6,628,833), and Rosenberg (US 6,088,392).

**(1) Regarding claim 13:**

Fan et al. and Szeliski and Horie, and Loce et al. disclose all the subject matter as described in claim 10 above.

Fan et al. and Szeliski and Horie, and Loce et al. do not explicitly mention the steps 13-d),13-e), and 13-f).

**Concerning the steps 13-d), and 13-e):**

Horie, in analogous environment, teaches an image processing method, where the text region is identified (figure 24, column 9, line 46-51), and analyzing the luminance histogram to identify the background region (figure 25, column 9, line 62-67).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Horie, where text region is identified, in the method of Fan et al. in order to improve the picture quality of the input image using a digital camera or an image scanner (column 1, line 19-20).

**Concerning the step 13-f):**

Rosenberg, in analogous environment, teaches a bit rate coder for differential quantization, where the using the chrominance histogram to determine statistically one of the standard deviation above and the below mean value (column 10, line 30-32), (the to determining of statistically one of the standard deviation above and the below mean value of the chrominance histogram is read as the same concept as the step 13-f).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Rosenberg, where using the chrominance histogram, in the method of Fan et al. in order to provide a high quality image application such as video conferencing over line 128 Kbps channels, where 3D codes are used, as well as for a high compression application (column 8, line 41-46).

**(2) Regarding claim 14:**

Fan et al. and Szeliski and Horie disclose substantially the claimed invention as set on the discussion above for claims 1 and 10.

Fan et al. and Szeliski and Horie do not disclose expressly that the local feature threshold value is 32.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the local feature threshold value as 32. Applicant has not disclosed that if the local feature threshold value is 32 will provide an advantage, be used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the determining of the local feature threshold thought by Fan et al. and Szeliski and Horie, or the claimed 14 local feature threshold, because both local feature threshold have the same function of segmenting an image.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the Fan et al. and Szeliski and Horie to obtain the invention specified in claim 14.

**(2) Regarding claim 15:**

Fan et al. further disclose the method, where the background threshold is related to an image size (column 4, line 15-28 and line 21-23), (the bounding area is read as the image size which is related to the background threshold).

**(3) Regarding claim 16:**

Fan et al. and Szeliski and Horie disclose substantially the claimed invention as set on the discussion above for claims 1 and 10.

Fan et al. and Szeliski and Horie do not disclose expressly that background threshold value is 12.5% of image size.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the background threshold value is 12.5% of image size. Applicant has not disclosed that if the local feature threshold value is 32 will provide an advantage, be used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the background threshold thought by Fan et al. and Szeliski and Horie, or the claimed 16 of the background threshold, because both local feature threshold have the same function of segmenting an image.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the Fan et al. and Szeliski and Horie to obtain the invention specified in claim 16.

**(3) Regarding claim 17:**

Fan et al. and Kadtke disclose all the subject matter as described in claims 10,11,12, and 13 above.

Fan et al. and Kadtke do not explicitly mention the method, where the identification of the background region is independent of image element color.

Horie, in analogous environment, teaches an image processing method, where the identification of the background region is independent of the image element color (column 7, line 50-51), (the image element color is read as the density of the photograph region).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Horie, where the identification of the background region is independent of the image element color, in the method of Fan et

al. in order to accommodate the influence of the illumination during images pickup, difference sheet quality, or the like. The document image background is excluding the text, and photograph from the document image (column 7, line 57-61).

**(4) Regarding claim 19:**

Fan et al. further disclose the method, where the identification of the background region further comprises the use of chroma foreground and a hue foreground mask (column 4, line 9-13), (the use of the dynamic range of the three-color channels is read as the same concept as the use of chroma foreground and hue foreground).

**(5) Regarding claim 20:**

Fan et al. further disclose the method, where the identification of contone regions comprises analyzing luminance histogram bins to determine the number of bins (N.sub.pop) containing more pixels than a contone threshold value (column 4, line 57-62), (the edge detection by the determination of the ratio of soft edge point to the strong edge point is read as the same function as the analyzing of luminance histogram bin), where the region is considered a contone region when N.sub.pop exceeds a uniformity threshold value (column 4, line 62-6)

**(5) Regarding claim 21:**

Fan et al. further disclose the method, where the analysis to identify contone regions comprises verification using regions properties (column 5, line 18-20, line 29-31, and line 36-38).

**(6) Regarding claim 22:**

Fan et al. further disclose the method, where the region properties comprises

area (column 4, line 19-23).

**(7) Regarding claim 29:**

Fan et al. and Kadtke et al. disclose an image segmentation method as in claims 10-12 above.

Fan et al. and Kadtke et al do not explicitly mention the following items:

1) the identification of the region as text when the local discriminating feature is above the local threshold value

2) the identification of the background region when the highest number of pixels exceeds a background threshold value and verifying the background region using chrominance data

Horie, in analogous environment, teaches an image processing method, where the text region is identified (figure 24, column 9, line 46-51), and analyzing the luminance histogram to identify the background region (figure 25, column 9, line 62-67) using chrominance data (column 8, line 45-49)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Horie, where the text region is identified, in the method of Fan et al. in order to improves the picture quality of the input image using a digital camera or an image scanner (column 1, line 19-20).

17. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al. and Szeliski and Horie, and Loce et al. and Kadtke, and Horie and Rosenberg, as applied to claims 10 and 13 above, and further in view of Barthel et al. (US 6,731,800).

Fan et al. and Szeliski and Horie, and Loce et al. and Kadtke, and Horie and Rosenberg disclose all the subject matter as described in claims 10 and 13 above.

Fan et al. and Szeliski and Horie, and Loce et al. and Kadtke, and Horie and Rosenberg do not expressly disclose the method, where expanding the background region into neighboring histogram bin.

Barthel et al., in analogous environment, teaches a method for compression scanned colored and gray-scaled documents, where expanding the foreground pixels with an average value filtration for adjoining pixels (column 5, line 7-9), (the expanding of the foreground pixels with an average value filtration for adjoining pixels is read as the same concept as the expanding of the background region into neighboring histogram bin).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Barthel et al., where expanding the background region into neighboring histogram bin, in the method of Fan et al. in order to make possible the compression of scanned documents without being restricted by the nature of the original copies, such as a bright background, rectangular illustrations and precise separation of image and text components (column 2, line 19-23).

***Allowable Subject Matter***

18. The following is an examiner's statement of reason for allowance:

Independent claim 28 is allowable over the prior art of record.

Independent claim 28, recite the limitation of: "verifying the contone region using region propertied, where the contone regions are eliminated when a contone region's area is smaller than the square of one tenth of the page width". The combination of these features as cited in the claim in combination with other limitations of the claims, are neither disclosed nor suggested by the prior art of record.

19. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact information***

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571) 270-1670. The examiner can normally be reached on Monday through Friday 7:30 Am to 5:00 PM E.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wu Jingge can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amara Abdi
07/20/2007.

JINGGE WU
SUPERVISORY PATENT EXAMINER